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10/582,334	06/09/2006	Tomoya Sugita	28951.1178	4915

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EXAMINER	
PETKOVSEK, DANIEL	
ART UNIT	PAPER NUMBER
2874	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/582,334	SUGITA ET AL.	
	Examiner	Art Unit	
	DANIEL PETKOVSEK	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Supplemental Amd filed August 27, 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-15, 17, and 18* is/are rejected.

7)☒ Claim(s) *16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *June 9, 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/17/08; 10/27/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the Supplemental Amendment filed August 27, 2008. In accordance with the amendment, claims 1 and 3-18 have been amended, while claim 2 has been canceled.

Claims 1 and 3-18 are pending.

Information Disclosure Statement

1. The prior art documents submitted by Applicant in the Information Disclosure Statements filed on June 17, 2008, have been considered and made of record (note attached copy of forms PTO-1449).

Claim Objections

2. Claim 6 is objected to because of the following informalities: the term "relatively small" has already been defined by claim 1 and need not be re-stated in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3-7, 11, 14, 17, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Du et al. U.S.P. No. 5,887,096.

Du et al. U.S.P. No. 5,887,096 teaches (ABS; Figs. 1, 6, 8, 12, 15-19, 22; column 6, line 12 through column 11, line 10) a laser light source comprising: a

plurality of semiconductor lasers for emitting a plurality of laser beams; and a waveguide for propagating the plurality of laser beams; wherein the plurality of laser beams are emitted from one end face of the waveguide; and the plurality of semiconductor lasers are arranged in a direction where spread angles of the laser beams are *relatively small*, which clearly, fully meets Applicant's claimed structural limitations for independent claim 1.

The Examiner notes that the term "**relatively** small" is a frame of reference limitation, and is met by Du et al. '096.

Regarding claim 3, Du et al. '096 meets the relational expression for a width of waveguide, a refractive index of waveguide, and a minimum beam spread angle of the laser.

Regarding claims 4-7, see figures 11-22 for a step difference portion(s) so that the waveguide cross section varies, in which the lasers are disposed on the step difference portions.

Regarding claim 11, the output intensities are approximately uniform.

Regarding claim 14, the lasers constitute an array.

Regarding independent claim 17, the system of Du et al. '096 is a two-dimensional image forming device including plural semiconductor lasers, a spatial light modulator, and a lighting optical system.

Regarding claim 18, a projection optical system projects output light in Du et al. '096.

5. Claims 1, 17, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al JP 2001-356404 A.

Suzuki et al JP 2001-356404 A teaches (ABS, Figs.) a laser light source comprising: a plurality of semiconductor lasers 1a/1b for emitting a plurality of laser beams; and a waveguide 5 for propagating the plurality of laser beams; wherein the plurality of laser beams are emitted from one end face of the waveguide; and the plurality of semiconductor lasers are arranged in a direction where spread angles of the laser beams are *relatively small*, which clearly, fully meets Applicant's claimed structural limitations for independent claim 1. The Examiner notes that the term "**relatively** small" is a frame of reference limitation, and is met by Suzuki JP '404.

Regarding independent claim 17, the system of Suzuki JP '404 is a two-dimensional image forming device including plural semiconductor lasers, a spatial light modulator, and a lighting optical system (see Figs. 1 and 3).

Regarding claim 18, a projection optical system projects output light in Suzuki JP '404.

6. Claims 1, 3, 6, 11, 14, 17, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokoyama U.S.P. No. 6,547,400 B1.

Yokoyama U.S.P. No. 6,547,400 B1 teaches (ABS, Figures) a laser light source comprising: a plurality of semiconductor lasers for emitting a plurality of laser beams; and a waveguide for propagating the plurality of laser beams; wherein the plurality of laser beams are emitted from one end face of the waveguide; and the plurality of semiconductor lasers are arranged in a direction where spread angles of the laser beams are *relatively small*, which clearly, fully

meets Applicant's claimed structural limitations for independent claim 1. The Examiner notes that the term "**relatively** small" is a frame of reference limitation, and is met by Yokoyama.

Regarding claim 3, Yokoyama meets the relational expression for a width of waveguide, a refractive index of waveguide, and a minimum beam spread angle of the laser.

Regarding claim 6, see figures for lasers arranged in a line with spread angles at a shift.

Regarding claim 11, the output intensities are approximately uniform.

Regarding claim 14, the lasers constitute an array.

Regarding independent claim 17, the system of Yokoyama is a two-dimensional image forming device including plural semiconductor lasers, a spatial light modulator, and a lighting optical system (see Figures).

Regarding claim 18, a projection optical system projects output light in Yokoyama.

7. Claims 1, 3-7, 11, 14, 17, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Omoda et al. JP 2003-299088.

Omoda et al. JP 2003-299088 teaches (ABS; **Figures 14-16**) a laser light source comprising: a plurality of semiconductor lasers for emitting a plurality of laser beams; and a waveguide for propagating the plurality of laser beams; wherein the plurality of laser beams are emitted from one end face of the waveguide; and the plurality of semiconductor lasers are arranged in a direction

where spread angles of the laser beams are *relatively small*, which clearly, fully meets Applicant's claimed structural limitations for independent claim 1.

The Examiner notes that the term “relatively small” is a frame of reference limitation, and is met by Omoda.

Regarding claim 3, Omoda meets the relational expression for a width of waveguide, a refractive index of waveguide, and a minimum beam spread angle of the laser.

Regarding claims 4-7, see figures 14-16 for a step difference portion(s) so that the waveguide cross section varies, in which the lasers are disposed on the step difference portions.

Regarding claim 11, the output intensities are approximately uniform.

Regarding claim 14, the lasers constitute an array.

Regarding independent claim 17, the system of Omoda is a two-dimensional image forming device including plural semiconductor lasers, a spatial light modulator, and a lighting optical system.

Regarding claim 18, a projection optical system projects output light in Omoda.

8. Claims 1, 4-7, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Hooker et al. U.S.P. No. 6,554,463 B2.

Hooker et al. U.S.P. No. 6,554,463 B2 teaches (ABS, Figs. 3 and 4) a laser light source 25 comprising: a plurality of semiconductor lasers 14 for emitting a plurality of laser beams; and a waveguide 12 for propagating the plurality of laser beams; wherein the plurality of laser beams are emitted from

one end face 43 of the waveguide; and the plurality of semiconductor lasers are arranged in a direction where spread angles of the laser beams are *relatively small*, which clearly, fully meets Applicant's claimed structural limitations for independent claim 1. Again, "**relatively** small" is a frame of reference limitation met by Hooker.

Regarding claims 4 and 5, the waveguide 12 has a number of step difference portions where the lasers 12 are located on the step difference portions. Regarding claims 6 and 7, the source 18 creates a relatively small (frame of reference) shift.

Regarding claim 11, the intensities are approximately uniform.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 8-10, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Du et al. U.S.P. No. 5,887,096.

Du et al. U.S.P. No. 5,887,096 teaches (ABS; Figs. 1, 6, 8, 12, 15-19, 22; column 6, line 12 through column 11, line 10) a laser light source comprising: a plurality of semiconductor lasers for emitting a plurality of laser beams; and a waveguide for propagating the plurality of laser beams; wherein the plurality of

laser beams are emitted from one end face of the waveguide; and the plurality of semiconductor lasers are arranged in a direction where spread angles of the laser beams are *relatively small*, which clearly, fully meets Applicant's claimed structural limitations for independent claim 1.

Du et al. '096 does not *explicitly* teach that the lasers have different oscillation wavelengths (at least three), being in the range of 1nm to 30 nm (claims 8-10); or are multistripe or stacked (claims 12 and 13). At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to use different oscillation wavelengths (at least three), being in the range of 1nm to 30 nm and multistripe/stacked lasers because Applicant has not disclosed that using different oscillation wavelengths (at least three), being in the range of 1nm to 30 nm or multistripe/stacked lasers provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Du et al. '096 to perform equally well with different oscillation wavelengths (at least three), being in the range of 1nm to 30 nm or multistripe/stacked lasers because, to one of ordinary skill in the art at the time the invention was made, these claim terms are easily integrated with the image forming device in the system to provide input for the projection system. Therefore, it would have been an obvious matter of design choice to modify Du et al. '096 to obtain the invention as specified in claims 8-10, 12, and 13. See *KSR v. Teleflex*, 127 S.Ct. 1727 (2007).

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Du et al. U.S.P. No. 5,887,096, applied to claim 1, and further in view of Cohn et al. U.S.P. No. 4,330,761.

Du et al. U.S.P. No. 5,887,096 teaches (ABS; Figs. 1, 6, 8, 12, 15-19, 22; column 6, line 12 through column 11, line 10) a laser light source comprising: a plurality of semiconductor lasers for emitting a plurality of laser beams; and a waveguide for propagating the plurality of laser beams; wherein the plurality of laser beams are emitted from one end face of the waveguide; and the plurality of semiconductor lasers are arranged in a direction where spread angles of the laser beams are *relatively small*, which clearly, fully meets Applicant's claimed structural limitations for independent claim 1.

Du et al. '096 does not *explicitly* teach that the waveguide has a liquid sealed therein.

Cohn et al. U.S.P. No. 4,330,761 teaches a waveguide with a laser provided thereto, in which a fluid/liquid core exists in the waveguide. The fluid core allows for improved lasing capabilities.

Since Du et al. '096 and Cohn et al. '761 are both from the same field of endeavor, the purpose disclosed by Cohn et al. '761 would have been recognized in the pertinent art of Du et al. '096.

A person having ordinary skill in the art at the time the invention was made would have recognized the teaching of Cohn et al. '761, to use a particular liquid/fluid filled waveguide core with mirrored surfaced to improved optical coupling through the waveguide and to decrease optical losses that occur during

the reflectivity of a laser source being pumped into the waveguide, in the device of Du et al. '096 to improve optical coupling efficiency. See *KSR v. Teleflex*, 127 S.Ct. 1727 (2007).

Allowable Subject Matter

12. Claim 16 is objected to as being dependent upon a rejected base claim 15 (and independent claim 1), but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record *does not teach or reasonably suggest* a **cooling mechanism** that is connected the waveguide, that which circulates a liquid sealed in a hollow part of the waveguide and the lasers being cooled as such.

Response to Arguments

13. The previous rejections to Fischer et al. '009 have been withdrawn, as Applicant has successfully sworn behind this reference.

14. New rejections to claims 1, 3-15, 17, and 18 have been made in this action. Accordingly, this action is made **NON-FINAL**. The normal statutory periods apply.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: PTO-892 form references A-D and U.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL PETKOVSEK whose telephone number is (571)272-4174. The examiner can normally be reached on M-F 8:30-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Uyen Chau Le can be reached on (571) 272-2397. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel Petkovsek/
Patent Examiner, Art Unit 2874
October 29, 2008

/Sung H. Pak/
Primary Examiner, Art Unit 2874